

XXXV. *An Account of an Observation of the Meteor of August 18, 1783, made on Hewit Common near York. In a Letter from Nathaniel Pigott, Esq. F. R. S. to the Reverend Nevil Maskelyne, D. D. F. R. S. and Astronomer Royal.*

Read June 24, 1784.

REVEREND SIR,

York, Oct. 18, 1783.

ON the 19th of last August I communicated to you an account of the remarkably fine meteor, which I had seen under circumstances peculiarly favourable the preceding night. I was then preparing myself for a journey into the East Riding; and, on that account, obliged to postpone the verifications, mentioned hereafter, till my return.

On the 18th of August, about ten o'clock P.M. after a hot day, the weather a little hazy, but not so as to obliterate the stars, and no wind, being on horseback, in company with two other gentlemen, on Hewit Common, about three miles from York, my attention was attracted towards the W.N.W. by several faint flashes of lightning, such as are often seen near the horizon, or which may be still better compared to flashes of an aurora borealis. Soon after which I perceived some luminous matter in motion, and collecting together from several directions, fig. 1. (tab. XX.) which immediately taking fire presented itself under the form of a ball, of so vivid a brightness, that the whole horizon was illuminated, so that the smallest object might

2

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have been seen on the ground. This ball, when formed, began to move, with an easy sliding motion, from W.N.W. towards the S.S.E. It suggested the idea of a highly brilliant comet, emitting a train or tail, but of a different colour from the ball itself, this last being of a most brilliant bluish white, and the tail of a dusky red, the length of which appeared to extend over fifteen or more degrees of the heavens, fig. 2. The apparent diameter of the nucleus seemed one-third or one-fourth of the full moon's diameter. The greatest difficulty in this estimation hence arises, that I cannot, notwithstanding all my endeavours, represent in my mind the moon otherwise than as a plane or disk; nor the meteor, than as a spherical body. The altitude of it, when it formed in the W.N.W. was about  $30^{\circ}$ ; and about  $19^{\circ}$  or  $20^{\circ}$  above the horizon, when it became extinct in the S.S.E. a few sparks of the tail, nearest the nucleus, scattering themselves much in the same manner as those of a sky-rocket when burnt out, fig. 3.

It has been said, that the ball divided itself into three or four parts before its extinction. To me it appeared to vanish or gently die away: what confirms me in the opinion, that it did not divide, is, that the three or four scattering parts above-mentioned were not of the bright colour of the ball itself, but of the dusky red which the tail invariably shewed. The interval of time from the meteor's formation to its extinction was nearly twenty seconds, perhaps two or three seconds less. The long habit I have of counting seconds in astronomical observations induces me to think this quantity may be relied on; and this I mention, because some have estimated it more, some less. Nine or ten minutes after its dissipation, I heard a noise, much resembling the report of a cannon at a very great distance; but I would not wish to have it understood, that I speak

speak to this last interval with the same certainty as to the other; if, however, it be exact, and supposing found to move 1106 feet in one second of time, and the same in the upper regions of the atmosphere as here below, which, however, may be very different, its distance from me, at its extinction, must have been about 120 miles, and its perpendicular altitude above the earth's surface about 40 miles.

I have added a scheme and a small sketch, presuming by that means to convey a clearer idea of what I saw. The altitudes, azimuths, &c. are not merely from estimation. After my return from the East Riding, I went to the very spot, where I had seen the meteor on the 18th of August. The road, as in the scheme, being exactly straight from my station, both *towards* and *from* York, no mistake can arise in that respect. With all the circumstances clearly and forcibly impressed on my mind, I watched till some remarkable spot in the sky presented itself at the same place in which I had seen the meteor itself form, cross the road, vanish, &c.: then, with a theodolite, I took the several bearings, which may be the more relied on, as I repeated the operations three different times, on different spots, which agree surprisingly well for measures where no minute exactness can be expected. I have marked minutes in the scheme, because the results gave them, without any pretension to such nicety.

I am, &c.

NATH. PIGOTT.

